

CLAIMS

1. A piston anti-rotation mechanism for a swash plate compressor assembly, the piston anti-rotation mechanism comprising:

a swash plate compressor having a piston-receiving bore and an anti-rotation groove formed adjacently therein; and

an anti-rotation piston having a body and a skirt extending therefrom, the body having a first radius of curvature and first and second ends, the body complementing the bore so that the body is slideably movable within the bore, the skirt extending from the second end of the body and having an arcuate outer surface complementing the groove so that the skirt is slideably movable along the groove, the skirt having a second radius of curvature being offset from the first radius of curvature so that the body and the skirt have differing axes of rotation preventing piston rotation.

2. The piston anti-rotation mechanism of claim 1 wherein the second radius of curvature is greater than the first radius of curvature and wherein the swash plate compressor further comprises:

a front head having a drive shaft side and an inner wall extending from the drive shaft side to an open end to define a crank case, the inner wall having the anti-rotation groove formed thereon and extending to the open end;

a cylinder having front and rear ends, the front end having the piston-receiving bore formed therethrough, the front end connecting to the open end so that the groove is adjacent the bore;

a drive shaft having first and second portions and rotatably disposed through the drive shaft side in the front head so that the first portion is disposed within the crank case; and

a swash plate angularly disposed about the first portion of the drive shaft in the crank case to angularly rotate the plate with the drive shaft as the drive shaft rotates.

3. The piston anti-rotation mechanism of claim 2 wherein the skirt forms a plate-receiving slot through which the swash plate angularly rotates to slideably move the piston along the groove.

4. The piston anti-rotation mechanism of claim 3 wherein the plate-receiving slot is defined by first and second walls having first and second shoe pockets respectively formed thereon.

5. The piston anti-rotation mechanism of claim 4 further comprising a shoe disposed in the shoe pocket for receiving the swash plate in the plate-receiving slot.

6. The piston anti-rotation mechanism of claim 1 wherein the axis of rotation of the skirt is within the piston.

7. The piston anti-rotation mechanism of claim 6 wherein the axis of rotation of the skirt is between the inner wall and the axis of rotation of the body.

8. The piston anti-rotation mechanism of claim 1 wherein the swash plate compressor assembly includes a plurality of grooves and bores formed adjacently therein.

9. The piston anti-rotation mechanism of claim 8 further comprising a plurality of pistons so that each piston is received in a respective groove and bore of the swash plate compressor assembly.

10. The piston anti-rotation mechanism of claim 1 wherein the skirt includes a planar outer surface integrally connected to the arcuate outer surface having the second radius of curvature.

11. A piston anti-rotation mechanism for a swash plate compressor assembly, the anti-rotation mechanism comprising:

a housing including an inner wall and a front end connected to the inner wall defining a crank case, the inner wall having an anti-rotation groove formed thereon, the front end having a piston-receiving bore formed therethrough adjacent the groove; and

an anti-rotation piston having a body and a skirt extending from the body, the body having a first radius of curvature and top and bottom ends, the body complementing the bore so that the body is slideably movable within the bore, the skirt extending from the bottom end and having an arcuate outer surface complementing the groove of the inner wall so that the skirt is slideably movable

along the groove when the body is disposed in the bore, the skirt having a second radius of curvature greater than the first radius of curvature and offset therefrom so that the body and the skirt have differing axes of rotation preventing rotation of the piston.

12. The anti-rotation mechanism of claim 11 wherein the housing further comprises:

a front head having a drive shaft side and an inner wall extending from the drive shaft side to an open end to define a crank case, the inner wall having the anti-rotation groove formed thereon and extending to the open end;

a cylinder having front and rear ends, the front end having the piston-receiving bore formed therethrough, the front end connecting to the open end so that the groove is adjacent the bore;

a drive shaft having first and second portions and rotatably disposed through the drive shaft side in the front head so that the first portion is disposed within the crank case; and

a swash plate angularly disposed about the first portion of the drive shaft in the crank case to angularly rotate the plate with the drive shaft as the drive shaft rotates.

13. The anti-rotation mechanism of claim 12 wherein the skirt forms a plate-receiving slot through which the sash plate angularly rotates to slideably move the piston along the groove.

14. The anti-rotation mechanism of claim 13 wherein the plate-receiving slot is defined by first and second walls having first and second shoe pockets respectively formed thereon.

15. The anti-rotation mechanism of claim 14 further comprising a shoe disposed in the shoe pocket for receiving the swash plate.

16. The anti-rotation mechanism of claim 11 wherein the axis of rotation of the skirt is within the piston.

17. The anti-rotation mechanism of claim 16 wherein the axis of rotation of the skirt is between the inner wall and the axis of rotation of the body.

18. The anti-rotation mechanism of claim 11 wherein the compressor assembly includes a plurality of grooves and bores formed adjacently therein.

19. The anti-rotation mechanism of claim 18 further comprising a plurality of pistons so that each piston is received in a respective groove and bore of the compressor assembly.

20. The anti-rotation mechanism of claim 11 wherein the skirt of the piston includes a planar outer surface integrally connected to the arcuate outer surface having the second radius of curvature.

21. A swash plate compressor assembly having a piston anti-rotation mechanism, the assembly comprising:

a front head having a drive shaft side and an inner wall extending from the drive shaft side to an open end to define a crank case, the inner wall having an anti-rotation groove formed thereon and extending to the open end;

a cylinder having front and rear ends, the front end having a piston-receiving bore formed therethrough, the front end connecting to the open end so that the groove is adjacent the bore;

a drive shaft having first and second portions and rotatably disposed through the drive shaft side in the front head so that the first portion is disposed within the crank case;

a swash plate angularly disposed about the first portion of the drive shaft in the crank case to angularly rotate the plate with the drive shaft as the drive shaft rotates; and

an anti-rotation piston having a body and a skirt extending from the body, the body having a first radius of curvature and first and second ends, the body complementing the bore so that the body is slideably movable within the bore, the skirt extending from the second end and having an arcuate outer surface complementing the groove of the inner wall so that the skirt is slideably movable along the groove, the skirt having a second radius of curvature greater than the first radius of curvature and offset therefrom so that the body and the skirt have differing axes of rotation preventing piston rotation, the skirt forming a plate-receiving slot through which the swash plate angularly rotates to slideably move the piston along the groove.

22. The assembly of claim 21 wherein the plate-receiving slot is defined by first and second walls having first and second shoe pockets respectively formed thereon.

23. The assembly of claim 22 further comprising a shoe disposed in the shoe pocket for receiving the swash plate.

24. The assembly of claim 21 wherein the axis of rotation of the skirt is within the piston.

25. The assembly of claim 24 wherein the axis of rotation of the skirt is between the inner wall and the axis of rotation of the body.

26. The assembly of claim 21 wherein the compressor assembly includes a plurality of grooves and bores formed adjacently therein.

27. The assembly of claim 26 further comprising a plurality of pistons so that each piston is received in a respective groove and bore of the compressor assembly.

28. The assembly of claim 21 wherein the skirt of the piston includes a planar outer surface integrally connected to the arcuate outer surface having the second radius of curvature.